Charles Eduardo Snyder

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I am not your typical job candidate. I obviously will need some initial investment to get my requisite teaching credentials. But I can offer unique perspective to the students of the Milton Hershey School. Whether it be Math or any of the Sciences, I have real-world experience that I can share with students to help them better understand how to apply the tools they are learning.

I have eight years' experience as research staff at the Institute of Defense Analyses, where I have supported a broad variety data analyst functions—from operational test and evaluation to chemical hazard transport and dispersion. I began my career as a research staff member after completing my PhD at the Pennsylvania State University, where I focused on colloidal- and nano-functionalization to achieve the bottom-up assembly of asymmetric particle formations.

After some introspection, I came to realize that one of my favorite parts of my current job is sharing information—to peers, to sponsors, or to students. As a flat organization with an academic work environment, I am often able to assist co-workers with projects, helping them hash through complex problems and sharing my expertise and experience. One of the challenges of my work is distilling complex analysis into high-level sponsor briefings; a highlight of any project is when I am able to convey information so that the sponsor "gets it." And I am always most satisfied with my day on those days that I tutor nearby high-school students in math and sciences. Though I have broadened my experience over the last eight years as an analyst, I am never more motivated than when helping someone learn.
My recent experience in the workplace has shaped my approach to teaching in that I am now more cognizant of and adaptable to different learning styles. In my work, I have worked with many new undergraduate hires and summer interns. While I have a mentoring role, I have found it best to teach core techniques while leaving analysis approaches open for the individual to explore—recognizing that there are many acceptable approaches to solve a problem. This active learning approach can mean a little more work on my part, but often, these bright new hires come up with interesting approaches to problems solving. Whether it be as a workplace mentor or as a tutor, I recognize that students or new hires are individuals with different strengths, learning styles, and problem solving approaches. By valuing the student of co-worker as a collaborator opposed to viewing my relationship to them as dictatorial, we both grow.

I have no delusion that the day-to-day of a life of service can be filled with difficulty, but I am ready to take the challenge of teaching. Off course, I am eager to talk with you as potential job candidate. However, if not considered for this position, I am interested in any perspective you might have time to offer regarding how to best transition to an institution like yours.

Sincerely,

Charles Snyder

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EXPERIENCE

Institute for Defense Analyses (IDA), Research Staff Member 2008—present
with active SECRET security clearance

Strategy, Forces and Resources Division ***(2012—present)***

Chemical, Biological, Radiological, and Nuclear (CBRN) Analysis Group

Support multiple Department of Defense and Department of Homeland Security agencies:

- Lead the development of analysis tools to enable CBRN hazard plume effects analysis with transport and dispersion models
- Model the spread of contagious disease (Susceptible, Exposed, Infectious, Removed methods)
- Model biological and chemical hazard spread through transit systems (analytic mass transfer approximation methods)
- Use a variety of analysis tools including Python, R, Mathematica, and Java Application Programming Interface hooks to enable data wrangling, software automation, and post-processing analysis

Operational Test and Evaluation Division ***(2008—2012)***

Supported the Director, Operational Test and Evaluation (DOT&E, Department of Defense):

- Represented the director and his deputies in all branches of the test and evaluation acquisition community
- Observed first hand and objectively evaluated operational system tests (primarily Unmanned Aerial Vehicles)—providing my assessment for the director's recommendation to Congress
- Provided technical guidance, support in test planning, and analytic analysis to the acquisition community and Director using a variety of quantitative techniques including Design of Experiments, Reliability Growth, and post-test analysis (e.g. Monte Carlo estimations of equipment availability)

Supported the Director, Office of SAFETY Act Implementation (Department of Homeland Security):

- Provided consolidated technical review and evaluation through a brief to the Director to enable informed decision to grant or deny limited liability status to anti-terrorism technology
- Developed policy and procedure to ensure consistent and unbiased analysis

Experience Specific to Education

- **(present)** Demonstrated and presented on the inner-workings of a home-build 3D printer at the Institute for Defense Analyses Science Fair for students of all ages
- **(2008-present)** Tutored college-bound students in math, physics, and chemistry through the Building Better Futures program—partnered with the Alexandria, Virginia public school system
- **(2014)** Designed and taught a 40-hour summer course for the Joint Science and Technology Institute—exposing college-bound students to basic programming (spreadsheet- and Python-based), statistics (to include bootstrapping), calculus, and transport and dispersion phenomena (see https://github.com/csnyd/Public2016/: JSTINotes.xlsx for curriculum notes and LinkToBootstrappingTutorial.txt for sample lecture)
- **(2007)** In addition to graduate teaching assistant responsibilities, through the Graduate Teaching Fellow Award at the Pennsylvania State University: co-taught "Biomedical Separation" under the Chemical Engineering department head

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The Pennsylvania State University (2003—2008)

Department of Chemical Engineering, PhD Candidate

PhD Thesis—Controlling Colloidal Interactions: Fabrication of Colloidal Assemblies Using Particle Lithography:

- Used of a variety of experimental techniques including nanoparticle synthesis, electron and optical microscopy, nanoparticle and colloidal particle characterization (e.g., surface charge, size distribution), particle isolation with density gradient centrifugation
- Drove experiment through modeling such as Brownian dynamic simulation, numerical analysis of asymmetrically functionalized colloidal interactions (van der Waals, electrostatic, and depletion induced forces), and Green's function use to characterize quorum sensing bacteria

EDUCATION

The Pennsylvania State University, PhD in Chemical Engineering May 2008

Case Western Reserve University, BS in Chemical Engineering May 2003

Continuous post-graduate development includes:

IDA sponsored education:

- Defense and research related: Aircraft Combat Survivability Short Course at the Naval Post Graduate School**,** DOT&E's Design of Experiments course**,** Georgia Tech's Basic Radar Concepts course**,** Defense Acquisition University Acquisition 101
- General leadership and personal development: Tufte's Data Visualization course, IDA task leadership course, DOT&E's Action Officer course, various writing workshops

Other personal development

- Online curriculum including, Stanford's Machine Learning course (by Andrew Ng), Coursera's "Learning How to Learn," various Java, Python, and other programming courses (through Northern Virginia Community College, Coursera, Udacity, etc.)

PUBLICATIONS

Co-Author, "User's Manual for the Chemical and Biological Attack Consequence Estimator Version 1.0" ` (2016).

Co-Author, "(U) Cassandra Homeland Analytic Product Support Technical Summary" (2016).

Co-Author, "User's Manual for the Hazard Prediction and Assessment Capability Batcher" (2015).

Co-Author, "(U) Encapsulation: A Quick-Look Assessment" (2015).

Co-Author, "(U) Transit Study Technical Review (2014).

Co-Author, "An Analytic Model for Chemical, Biological, Radiological, and Nuclear (CBRN) Requirements Generation for Percutaneous Protection (U)" (2013).

Co-Author, "Operational Effects Analytical Support Program (ASP) Long Term Effort -- Chemical Biological Force Planning Construct -- Phase II" (2013).

Co-Author, "Reliability Survey of DOT&E Acquisition Programs" (2013).

Co-Author, "Reliability Survey of DOT&E Acquisition Programs" (2012).

Co-Author, "Tactical Unmanned Aircraft System Full-Rate Production Version V Configuration (RQ-7BV1) Limited User Test" (2011).

Co-Author, "Test and Evaluation Concept for the Tier II Small Tactical Unmanned Aircraft System (STUAS)" (2010).

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Co-Author, “IDA Document D-4471, Reliability Survey of DOT&E Acquisition Programs” (2011).
Co-Author, "Prolonging Density Gradient Stability" Langmuir, (April 2010).
Co-Author, "Controlled Flats on Spherical Polymer Colloids" Langmuir (December, 2009).
Co-Author, "IDA Document D-3942, Reliability Survey of DOT&E Acquisition Programs" (September 2009).
Co-Author, "Rayleigh− Beìnard Instability in Sedimentation" Industrial & Engineering Chemistry Research, 48(5), 2414-2421 (2009).
Co-Author, “In Solution Assembly of Colloidal Water” Soft Matter, 5, 1263-1268 (2009).
Co-Author, “Localized Quorum Sensing in Vibrio fischeri” Colloids and Surfaces B, 62, 180-187, (2008).
Co-Author, “Site-Specific Functionalization on Individual Colloids: Size Control, Stability and Multi-Layers” Langmuir, 23, 9069-9075 (2007).
Co-Author, “Fabrication of Doublets by a Salting Out – Quenching – Fusing Technique” Langmuir, 22, 9135-9141 (2006).
Co-Author, “Charge Nonuniformity Light Scattering” Colloids and Surfaces A, 267, 79-85 (2005).
Co-Author, “Particle lithography method and ordered structures prepared thereby” U.S Patent application PST-14302/36 (2005).
Co-Author, “Nanoscale Functionalization and Site-Specific Assembly of Colloids by Particle Lithography” Langmuir, 21, 4813-4815 (2005).
Co-Author, June 2005. Nanoscale Functionalization and Site-Specific Assembly of Colloids by Particle Lithography. 79th ACS Colloid and Surface Science Symposium, Potsdam, NY.
Co-Author, June 2006. In-solution Directed Assembly of Heterogeneous Colloidal Aggregates. 233rd American Chemical Society National Meeting, Chicago, IL.
Co-Author, October 2006. Site Specific Functionalization of Colloids. The Pennsylvania State University Chemical Engineering Department Symposium. University Park, PA.

PATENTS

Velegol, Darrell; Feick, Jason D.; Yake, Allison M.; Snyder, Charles. “Particle lithography method and ordered structures prepared thereby.” U.S Patent application PST-14302/36 (2005).

PRESENTATIONS

Co-Author, November 2016. Use of Modeling in Table-top Exercise Support. MORS Wargaming Symposium, Alexandria VA.
Charles E. Snyder and Darrell Velegol, June 2005. Nanoscale Functionalization and Site-Specific Assembly of Colloids by Particle Lithography. 79th ACS Colloid and Surface Science Symposium, Potsdam, NY.
Charles E. Snyder and Darrell Velegol, October 2006. Site Specific Functionalization of Colloids. The Pennsylvania State University Chemical Engineering Department Symposium. University Park, PA.
Charles E. Snyder and Darrell Velegol, June 2005. In-solution Directed Assembly of Heterogeneous Colloidal Aggregates. 233th American Chemical Society National Meeting, Chicago, IL.